Integrated Science Final Project Proposal

One-Time Pad file encryption using Chaos Circuit

The Chua Circuit is a well known oscillator that exhibits chaotic behavior. For my final project, I propose to build the circuit and to use it as a true random number generator in for file encryption.

The Electronics component includes building the circuit, simulating the underlying ODEs in MATLAB and doing data collection using an Analog-Digital-Converter and a Raspberry Pi.

The CS component involves testing the random numbers so obtained for an indicator of true randomness, generating seed signals from the computer to restart/rescale the circuit, and using these numbers to encrypt any general purpose file (mp3, txt, etc), and decrypt them using the One-Time Pad so generated.

I have been working with Prof.Gruber and Prof.Hobor to aid in development and they are in agreement that this will be sufficient for the final project.